



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/471,071	12/21/1999	TONGBI JIANG	MICRON.110A	6968
20995	7590	07/14/2005	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP			CHAMBLISS, ALONZO	
2040 MAIN STREET			ART UNIT	
FOURTEENTH FLOOR			PAPER NUMBER	
IRVINE, CA 92614			2814	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/471,071

Applicant(s)

JIANG, TONGBI

Examiner

Alonzo Chambliss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-23 and 25-30 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration..  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 8-23 and 25-30 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 21 December 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The amendment filed on 6/15/05 has been fully considered and made of record in the instant application.

### *Response to Arguments*

2. Applicant's arguments filed 6/15/05 have been fully considered but they are not persuasive.

Applicant alleges Distefano fails to teach solder balls provided over a die attach layer and that the adhesive layer has the claimed properties is provided between a chip and an array of solder balls. This is deemed unpersuasive because Distefano teaches a die attach layer 11 (i.e. adhesive layer) has the claimed properties is provided between a chip 2 and an array of solder balls 11. The die attach layer has modulus of elasticity of 300 MPa – 600MPa (i.e. about 50.8 – 100 ksi) and a coefficient of thermal expansion of less than about 100 - 150 ppm/°C (i.e. about 106 to 200 ppm/°C) (see col. 7 lines 10-67 and col. 8 lines 22-65; Figs. 6 and 7).

Applicant alleges that Distefano fails to teach conductive terminal (i.e. solder bumps) over a compliant material with certain claimed properties. This is deemed unpersuasive because Distefano teaches conductive terminals 12 (i.e. solder bumps) over a compliant material with certain claimed properties (see Fig. 6).

Therefore, this action is made **final**.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 8, 9, 11-23, and 25-30 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Distefano (US 6,309,915).

With respect to Claims 8, 9, 15-17, 19-23, 25-30, Distefano teaches a die 2, a die attach layer or compliant material 11 (i.e. an epoxy modified with elastomeric material) over the die 2, and an array of solder balls 12 over the die attach layer 11, wherein the die attach layer has modulus of elasticity of 300 MPa – 600MPa (i.e. about 50.8 – 100 ksi) and a coefficient of thermal expansion of less than about 100 - 150 ppm/°C (i.e. about 106 to 200 ppm/°C). A flexible tape 4, 5 made of polyimide (i.e. TAB or a flexible substrate or a flexible dielectric tape with a prefabricated array of leads) connects the array 12 to the chip 2, wherein one end of the tape 4, 5 is located over the adhesive layer 11, and another end of the tape is located over the chip 2. The solder balls 12 are for connecting the first level package to a second level package (i.e. external circuit or printed stiff major panel). The conductive terminals 12 are provided over the compliant material 11 (see col. 2 lines 5-10, col. 6 lines 65-67, col. 7 lines 1-49, col. 8 lines 40-65, and col. 10 lines 8-30; Figs. 1, 3, 4, 6, and 8A-8S).

With respect to Claims 12, 13, and 18, Distefano teaches the array that is a tape ball grid array and micro ball grid array (see Fig. 6).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Distefano (US 6,309,915) as applied to claim 8 above, and further in view of Yamamoto et al. (US 6,265,782).

With respect to Claim 10, Distefano discloses the claimed invention except for the die attach layer having a thickness of between about 5 and 7 mils. However, Yamamoto discloses a die attach layer having a thickness of 127 micrometers (i.e. 5

Art Unit: 2814

mils) (see col. 16 lines 36-38). Thus, Distefano and Yamamoto both have substantially the same environment of a die attach material between a chip and an external device. Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate a tape having a thickness of 5 mils in the product of Distefano, since the thickness of the tape would provide stable thermal stress relaxation effect for the semiconductor device while having a strong adhesion between the chip and the leads as taught by Yamamoto.

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

### **Conclusion**

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

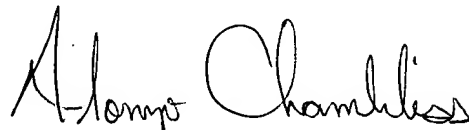
Art Unit: 2814

Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (571) 272-1927.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system see <http://pair-dkect.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or [EBC\\_Support@uspto.gov](mailto:EBC_Support@uspto.gov).

AC/July 11, 2005

A handwritten signature in black ink, appearing to read 'Alonzo Chambliss', is positioned above the printed name and title.

Alonzo Chambliss  
Primary Patent Examiner  
Art Unit 2814